

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 January 2004 (29.01.2004)

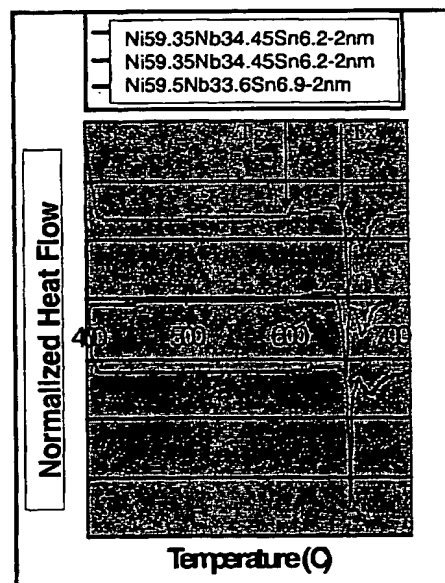
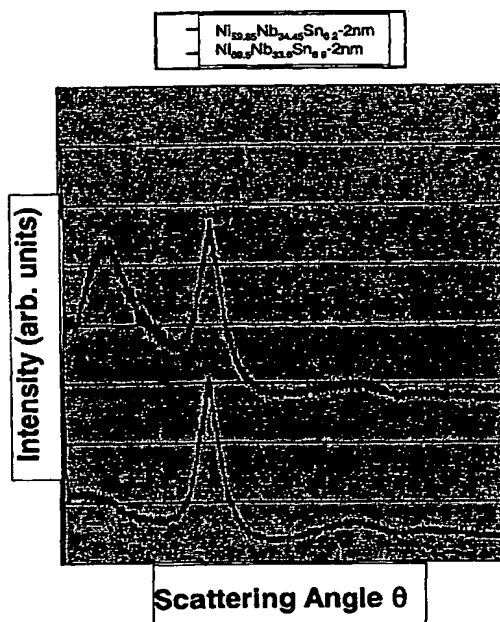
PCT

(10) International Publication Number
WO 2004/009268 A3

- (51) International Patent Classification⁷: **C22C 45/04**
- (21) International Application Number:
PCT/US2003/022933
- (22) International Filing Date: 22 July 2003 (22.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/397,950 22 July 2002 (22.07.2002) US
- (71) Applicant (for all designated States except US): CALIFORNIA INSTITUTE OF TECHNOLOGY [US/US]; 1200 East California Boulevard, Mail Stop 201-85, Pasadena, CA 91125 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): YIM, Haein, Choi [KR/US]; 848 West Huntington Drive, Unit 36, Arcadia, CA 91007 (US). XU, Donghua [KP/US]; 1028 East Del Mar Boulevard, #204, Pasadena, CA 91106 (US). JOHN-SON, William, L. [US/US]; 3546 Mountain View Street, Pasadena, CA 91107 (US).
- (74) Agent: PECK, John, W.; Christie, Parker & Hale, LLP, Suite 500, 350 West Colorado Boulevard, P.O. Box 7068, Pasadena, CA 91109-7068 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report

[Continued on next page]

(54) Title: BULK AMORPHOUS REFRACTORY GLASSES BASED ON THE Ni-Nb-Sn TERNARY ALLOY SYTEM



(57) Abstract: Bulk amorphous alloys based on a ternary Ni-Nb-Sn alloy system, and the extension of this ternary system to higher order alloys by the addition of one or more alloying elements, methods of casting such alloys and articles made of such alloys are provided.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:
8 April 2004

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/22933

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C22C 45/04

US CL : 148/403

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 148/403, 304; 420/441

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WEST- (amorphous or glassy) and (nickel or ni) and (tin or sn) and (niobium or nb)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,416,709 A (OHYA et al.) 22 November 1983 (22.11.1983), see column 3, line 25 to column 5, line 58.	1-30
A	US 6,325,868 B1 (KIM et al.) 04 December 2001 (04.12.2001), see entire document.	1-30

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

13 January 2004 (13.01.2004)

Date of mailing of the international search report

03 FEB 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

Roy V King

Telephone No. 703-308-0661